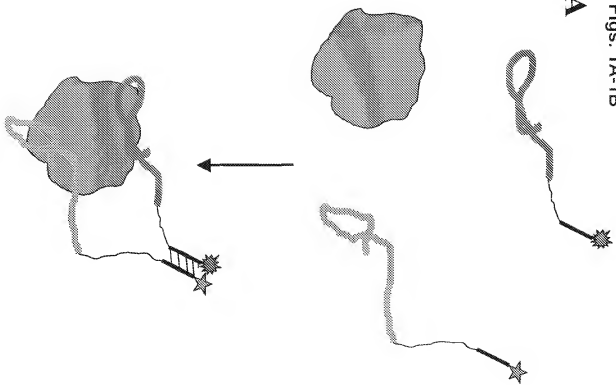
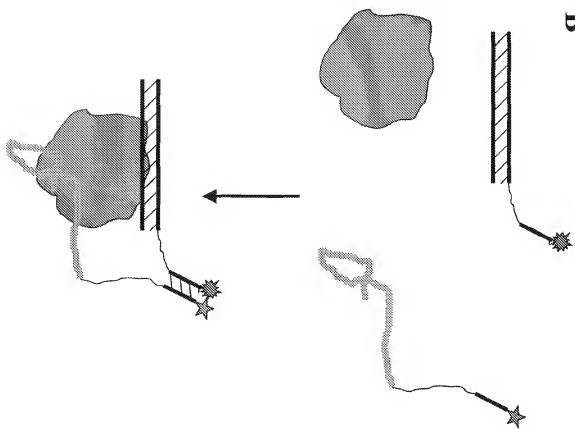


Figs. 1A-1B

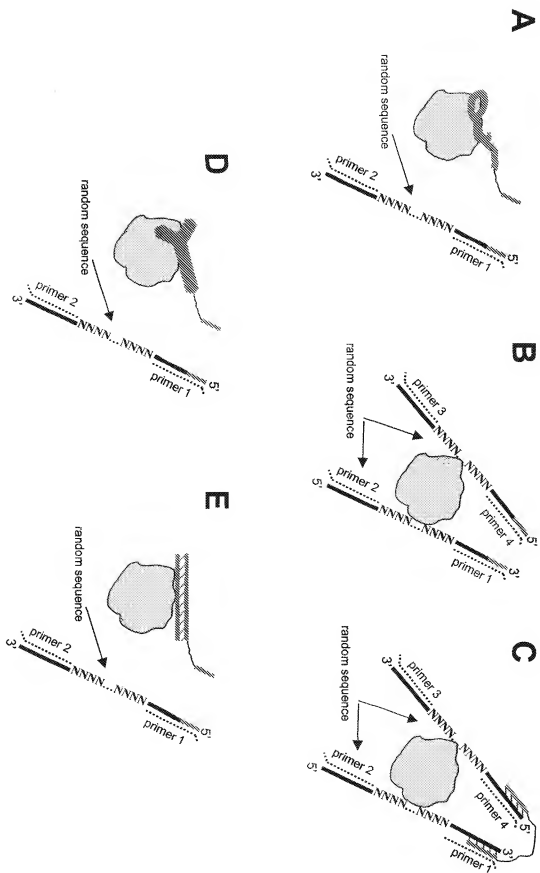
A



B

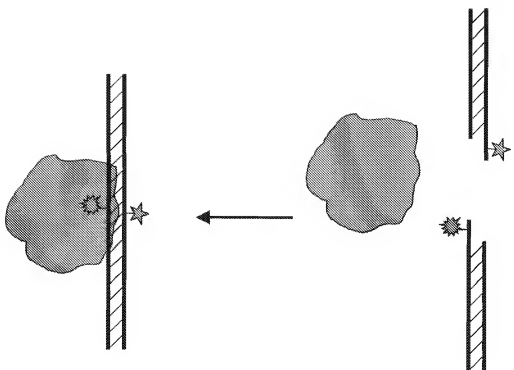


Figs. 2A-2E



Figs. 3A-3B

A



B

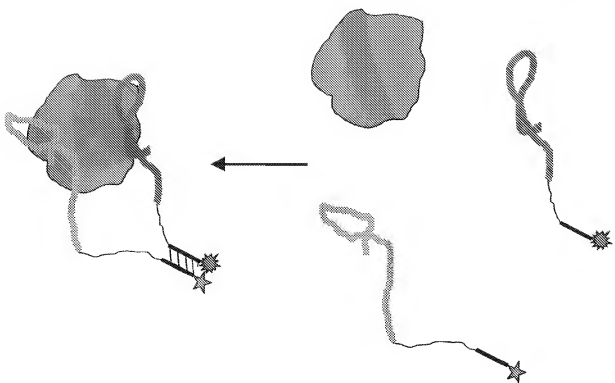
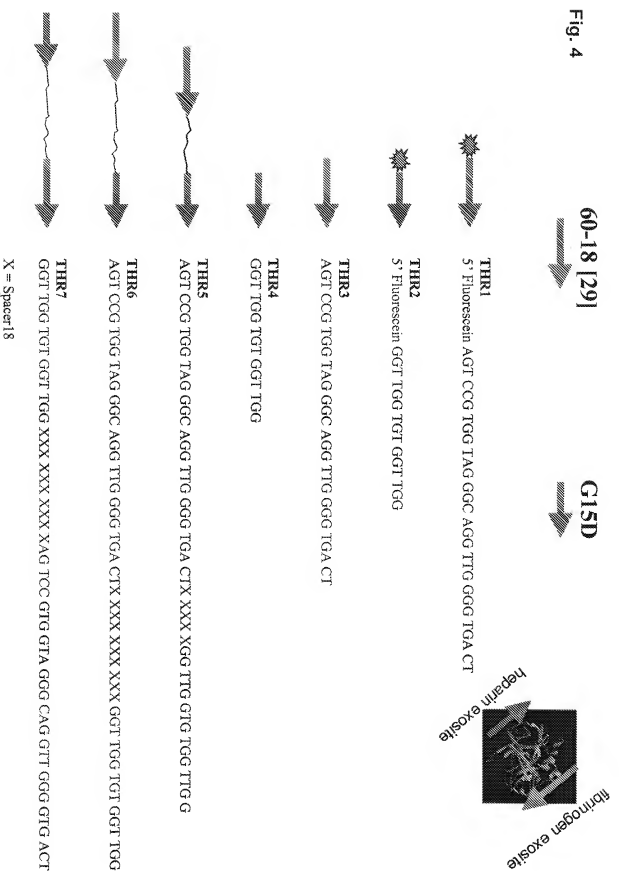
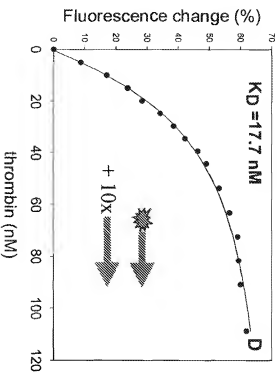
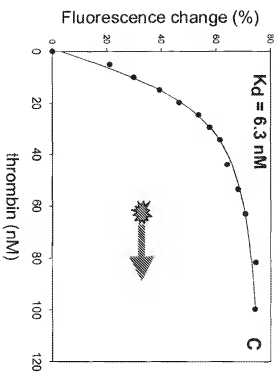
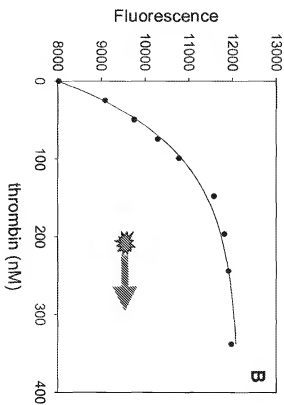
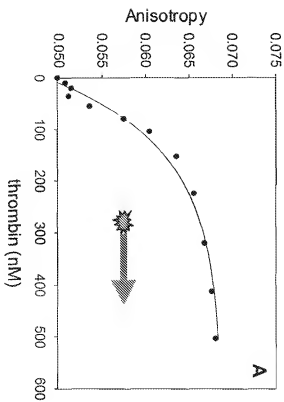


Fig. 4



Figs. 5A-5D



Figs. 6A-6D

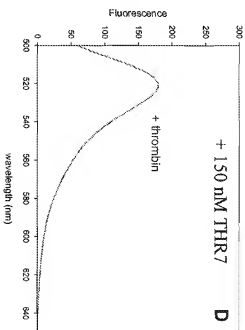
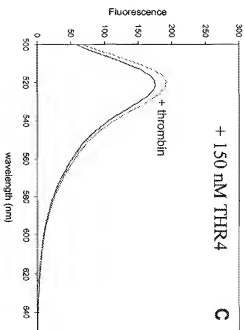
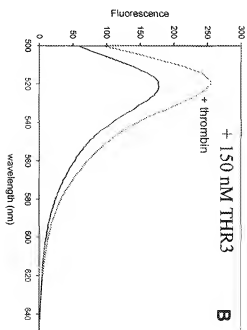
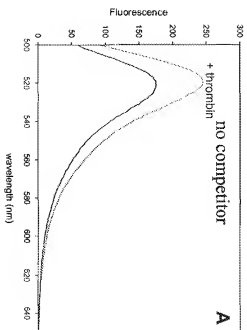
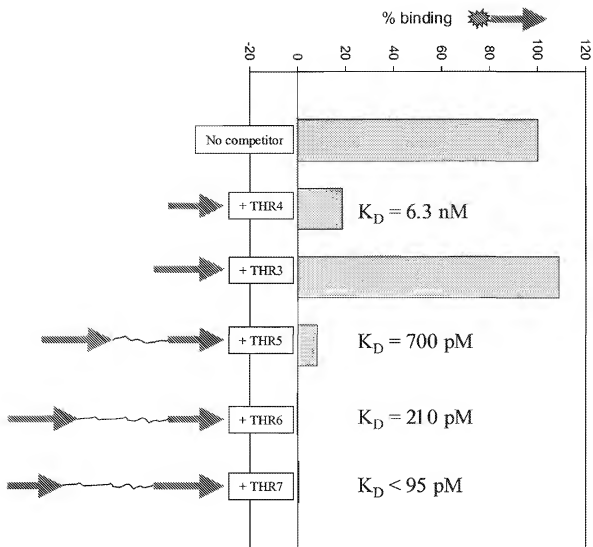
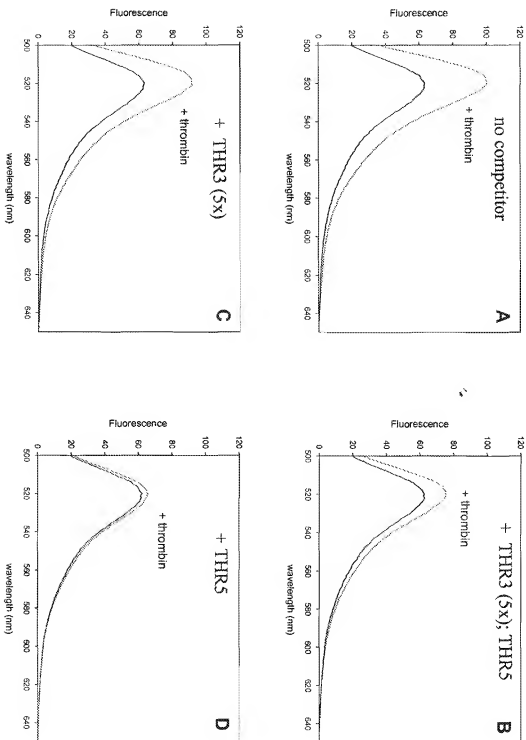


Fig. 7



Figs. 8A-8D



Figs. 9A-9B

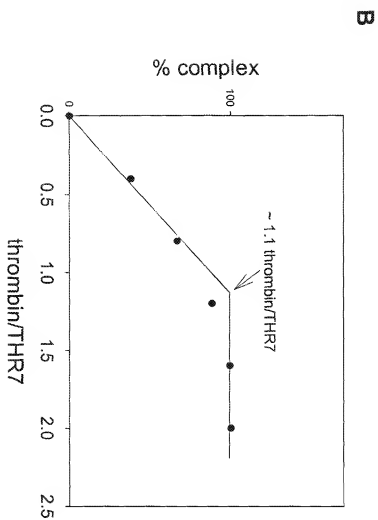
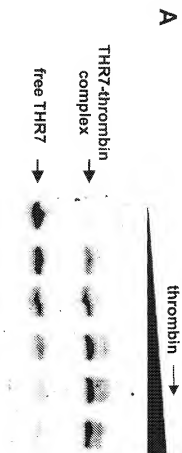
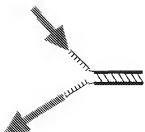


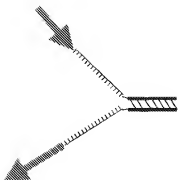
Fig.10

60-18 [29]

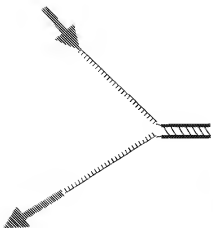
G15D



THR14
GGT TGG TGT GGT TGG TTT TTT T CTG TCG TTA GTG AAG GTT
THR15
AAC CTT CAC TAA CGA CAG TTT TTT T AGT CCG TCG TAG GGC
AGG TTG GGG TGA CT

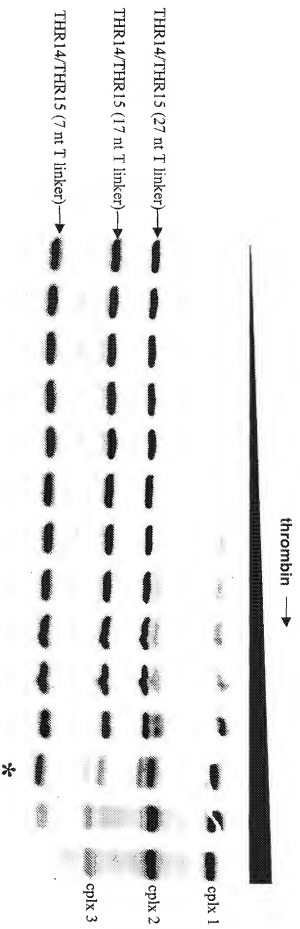


THR16
GGT TGG TGT GGT TGG TTT TTT TTT TTT TTT TT CTG TCG TTA GTG
AAG GTT
THR17
AAC CTT CAC TAA CGA CAG TTT TTT TTT TTT TTT TT AGT CCG TCG
TAG GGC AAG TTG GGG TGA CT

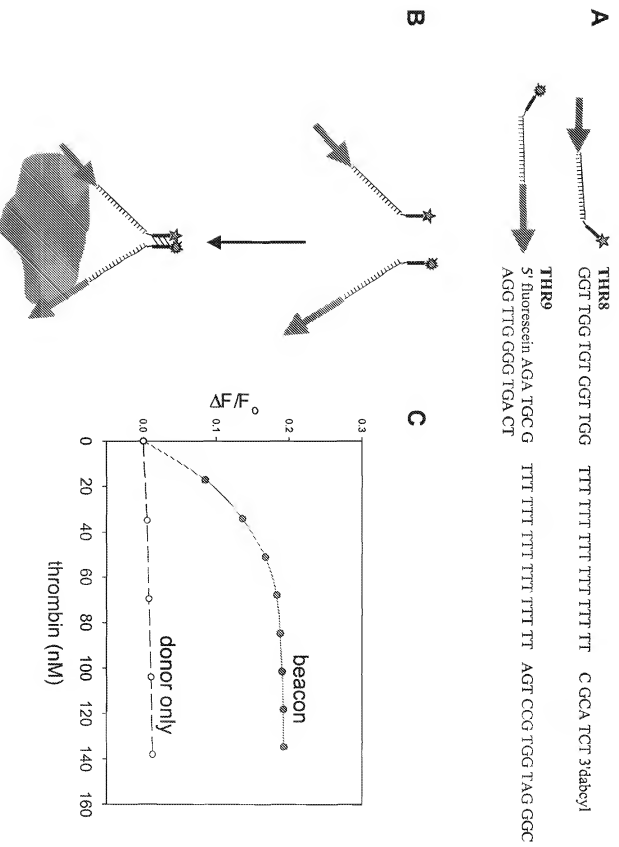


THR18
GGT TGG TGT GGT TGG TTT TTT TTT TTT TTT TTT TTT CTG TCG
TTA GTG AAG GTT
THR19
AAC CTT CAC TAA CGA CAG TTT TTT TTT TTT TTT TTT TTT TTT AGT
CCG TCG TAG GGC AAG TTG GGG TGA CT

Fig. 11



Figs. 12A-12C



Figs. 13A-13C

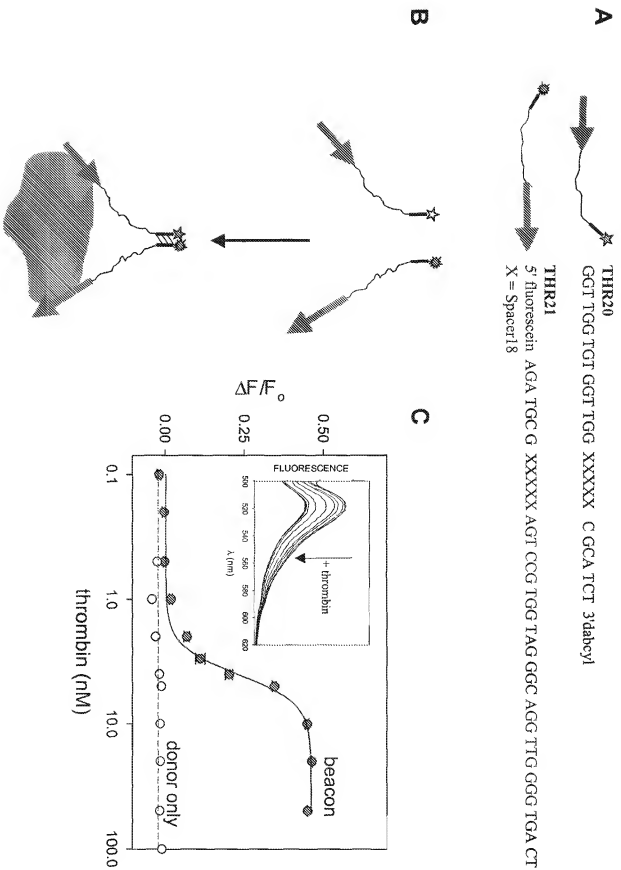
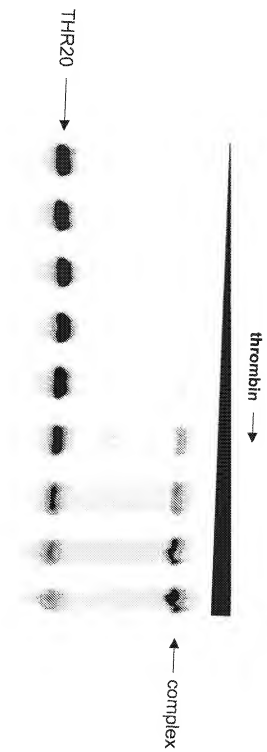


Fig. 14



Figs. 15A-15B

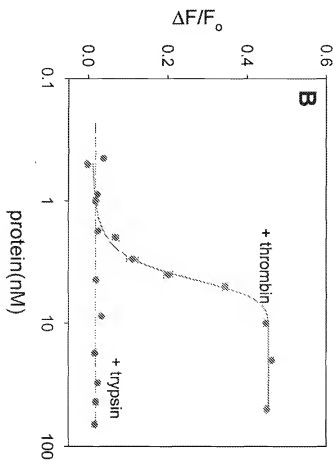
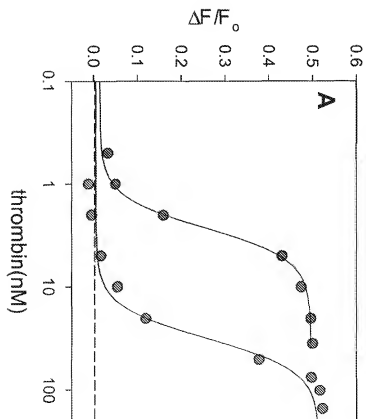
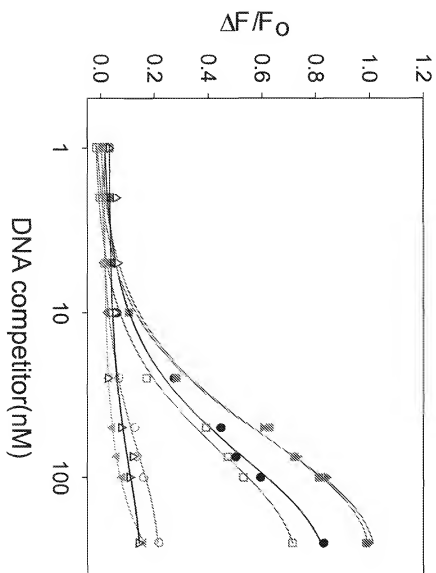
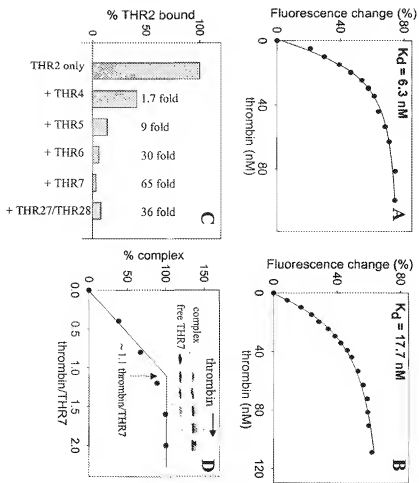


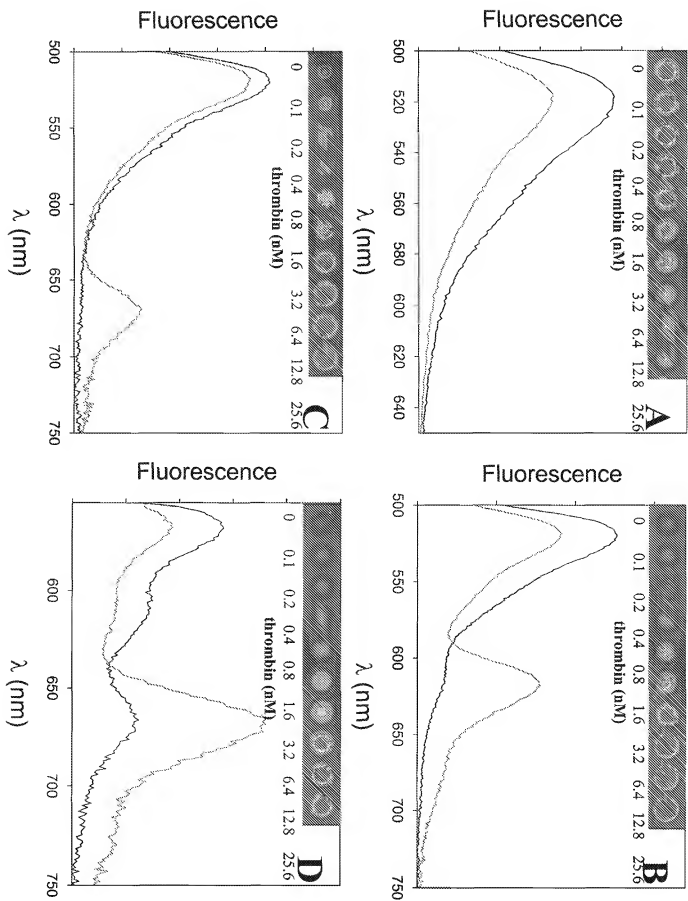
Fig. 16



Figs. 17A-17D



Figs. 18A-18D



Figs. 19A-19F

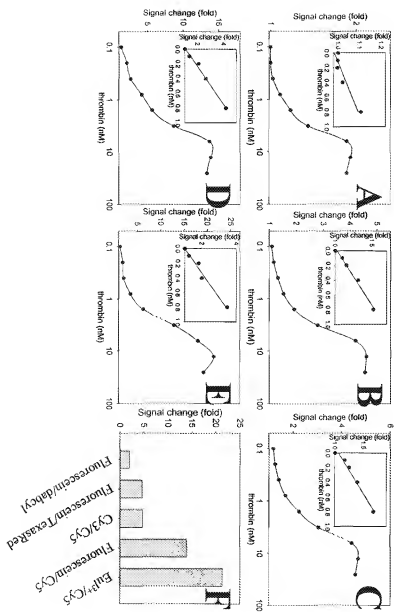
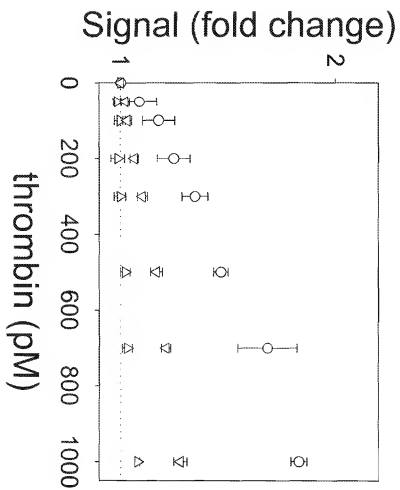


Fig. 20



Figs. 21A-21B

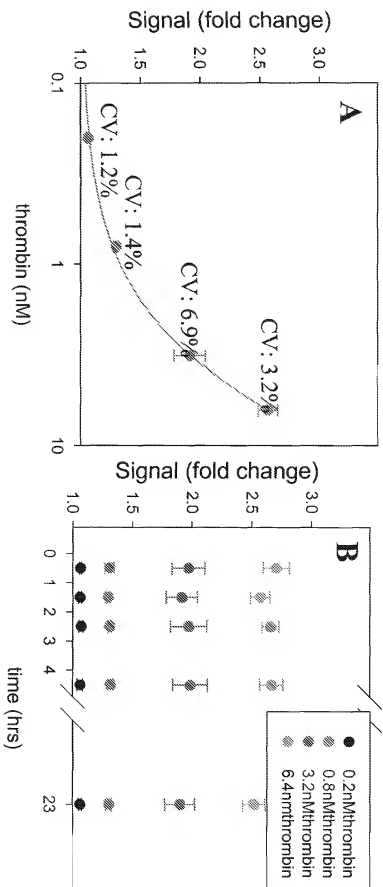
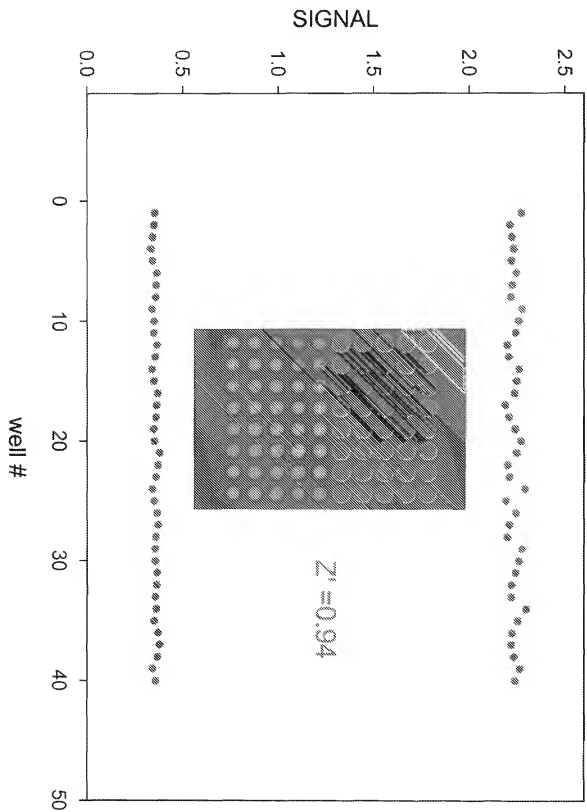
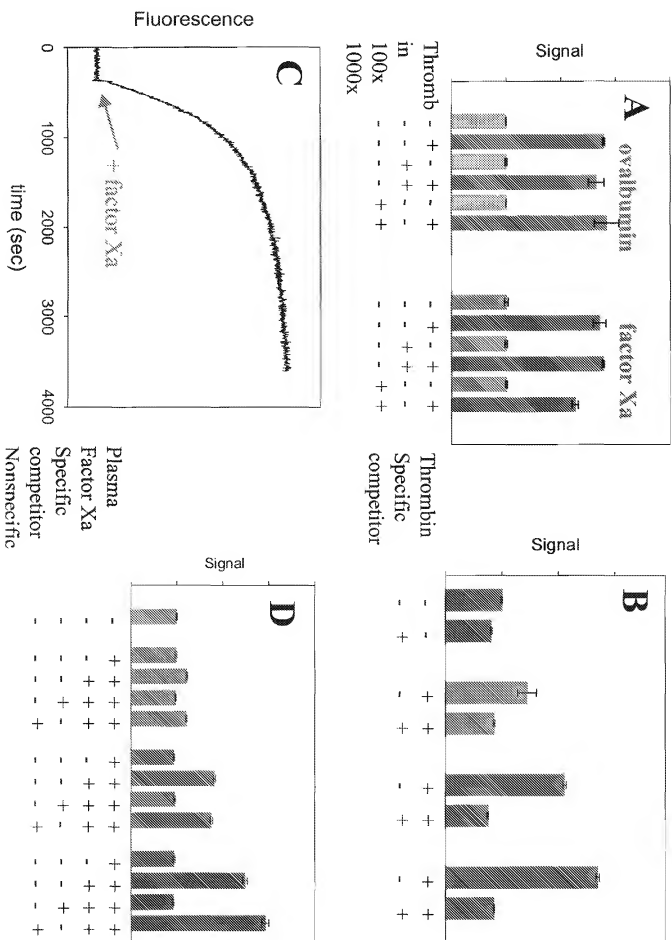
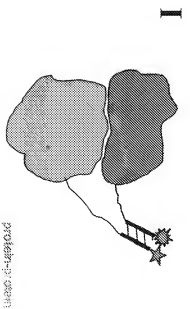
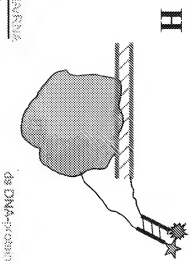
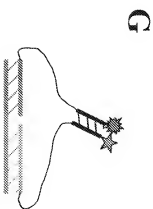
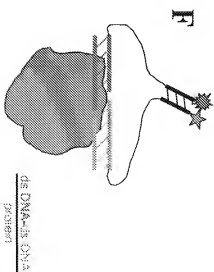
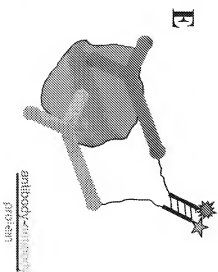
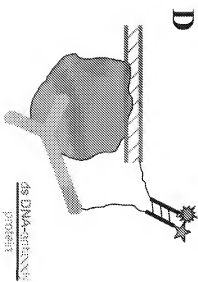
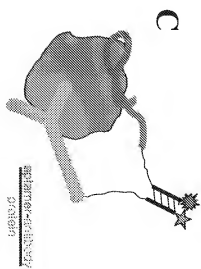
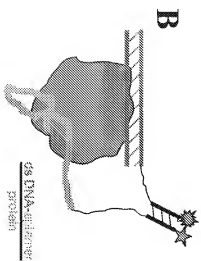
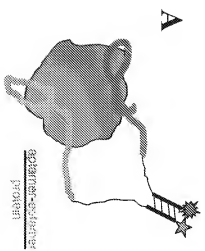


Fig. 22



Figs. 23A-23D

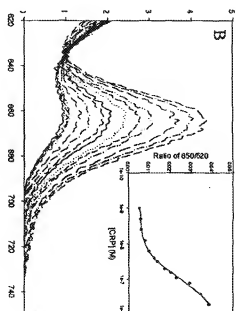
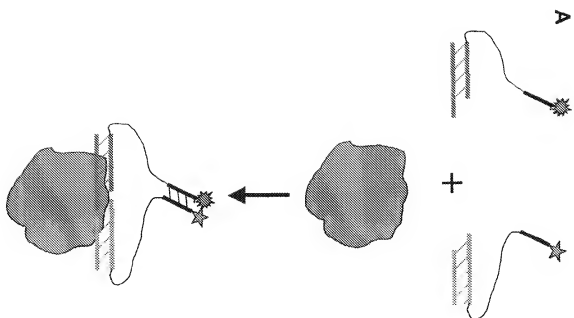




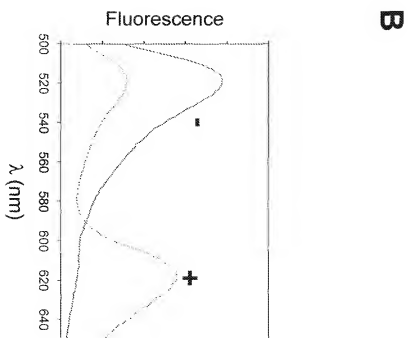
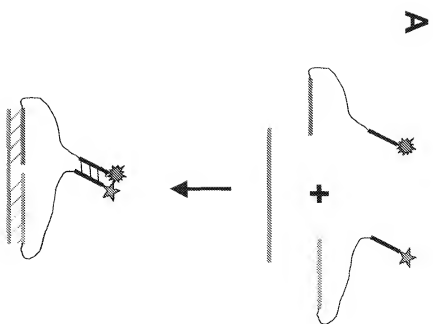
Figs. 24A-24I

ss DNA-ligase protein
ss DNA-ligase

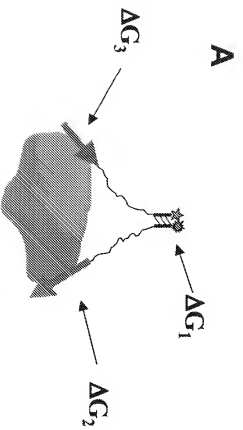
Figs. 25A-25B



Figs. 26A-26B



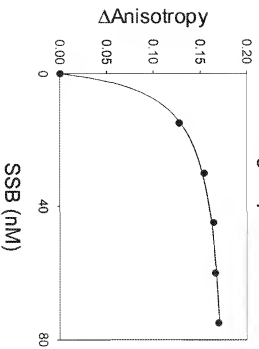
Figs. 27A-27C



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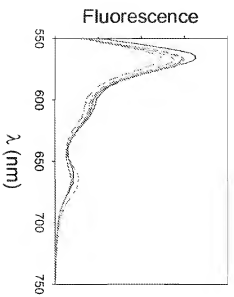
B

Nonspecific binding to single aptamer



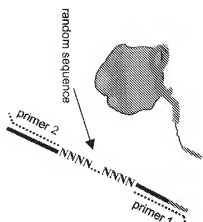
C

No signal with the beacon



Figs. 28A-28C

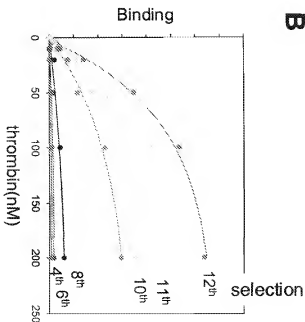
A



C

clone1 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone2 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone3 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone4 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone5 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone6 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone7 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone8 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone9 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone10 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone11 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone12 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone13 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone14 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone15 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone16 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone17 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone18 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone19 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone20 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone21 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone22 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone23 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone24 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone25 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone26 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone27 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone28 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone29 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone30 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone31 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone32 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone33 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone34 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone35 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone36 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone37 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone38 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone39 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone40 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone41 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone42 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone43 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone44 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone45 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone46 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone47 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone48 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone49 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone50 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone51 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone52 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone53 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone54 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone55 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone56 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone57 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone58 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone59 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone60 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone61 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone62 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone63 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone64 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone65 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone66 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone67 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone68 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone69 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone70 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone71 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone72 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone73 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone74 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone75 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone76 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone77 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone78 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone79 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone80 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone81 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone82 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone83 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone84 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone85 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone86 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone87 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone88 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone89 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone90 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone91 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone92 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone93 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone94 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone95 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone96 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone97 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone98 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone99 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33
clone100 - GCGCGG AAGCGATGACGATGAG AAGGCGG 33

B

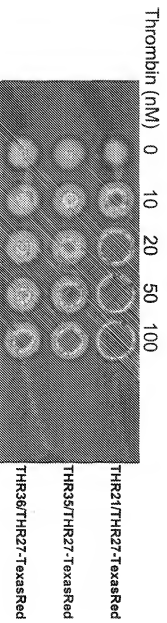


Figs. 29A-29B

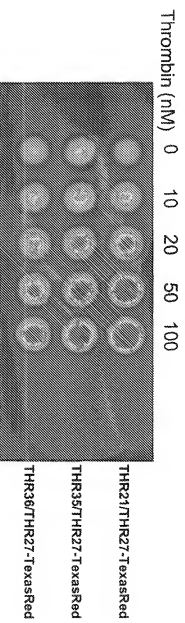
clones 20,21,24,26

5'fluoresceinAGATGGGXXXXAGGTTGGGCGTACTACGTATCAA TGGCTA GGG TGG TGT AACGC THR35
 5'fluoresceinAGATGGGXXXXAGGTTGGGCGTACTACGTATCAA TGGCTA GGG TGG TGT AACGCCATAT THR36

A

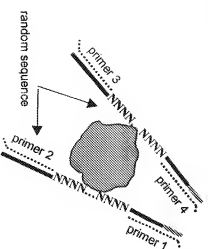


B



Figs. 30A-30C

A



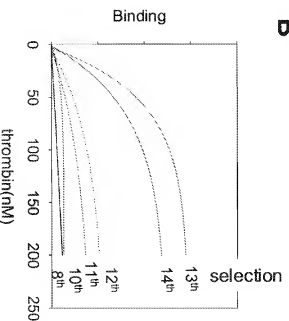
C

```

clone1-1  --GGTACGGTGGTTCATATGAGG--ATTGCAT----- 30
clone1-2  --GGTTAGCGTGGTTCATATGAGG--ATTGCAT----- 30
clone1-4  --GGTTAGCGTGGTTCATATGAGG--ATTGCAT----- 30
clone1-5  --GGTTAGCGTGGTTCATATGAGG--ATTGCAT----- 30
clone1-9  --GGTTAGCGTGGTTCATATGAGG--ATTGCAT----- 30
clone2-4  --GGTTAGCGTGGTTCATATGAGG--ATTGCAT----- 30
clone2-7  --GGTTAGCGTGGTTCATATGAGG--ATTGCAT----- 30
clone2-10 --GGTTAGCGTGGTTCATATGAGG--ATTGCAT----- 30
clone2-8  --GGTTAGCGTGGTTCATATGAGG--ATTGCAT----- 30
clone2-9  --GGTTAGCGTGGTTCATATGAGG--ATTGCAT----- 30
clone2-12 --GGTTAGCGTGGTTCATATGAGG--ATTGCAT----- 30
clone2-14 --GGTTAGCGTGGTTCATATGAGG--ATTGCAT----- 30
clone1-8  --GGTTAGCGTGGTTCATATGAGG--ATTGCAT----- 30
clone2-2  --GGTTAGCGTGGTTCATATGAGG--ATTGCAT----- 30
clone1-7  --GGTTAGCGTGGTTCATATGAGG--ATTGCAT----- 30
clone2-5  --GGTTAGCGTGGTTCATATGAGG--ATTGCAT----- 30
clone2-13 --GGTTAGCGTGGTTCATATGAGG--ATTGCAT----- 30
clone2-3  --GGTTAGCGTGGTTCATATGAGG--ATTGCAT----- 30
clone2-11 --GGTTAGCGTGGTTCATATGAGG--ATTGCAT----- 30
clone2-1  --GGTTAGCGTGGTTCATATGAGG--ATTGCAT----- 30
clone1-10 --GGTTAGCGTGGTTCATATGAGG--ATTGCAT----- 30
clone1-6  --GGTTAGCGTGGTTCATATGAGG--ATTGCAT----- 30
clone1-3  --GGTTAGCGTGGTTCATATGAGG--ATTGCAT----- 30
clone2-6  --GGTTAGCGTGGTTCATATGAGG--ATTGCAT----- 30
ruler 1.....10.....20.....30.....40

```

B



Figs. 32A-32B

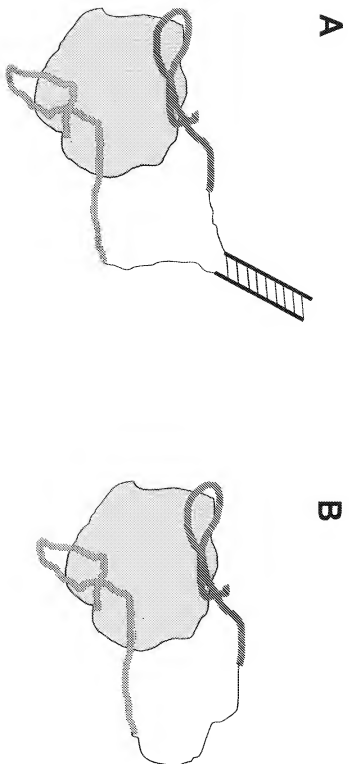


Fig 33

